



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/695,724

10/28/2003

Eric Frayssinet

15675P314CX

5542

8791

7590

01/18/2006

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

LEE, HSIEN MING

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/695,724	Applicant(s) FRAYSSINET ET AL.	
	Examiner Hsien-ming Lee	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 13, 14, 16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☒ Claim(s) 13, 14, 16 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/530,050.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE
PRIMARY EXAMINER

1/16/06

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's cancellation to claims 11, 12, 15, and 17 is acknowledged. Claims 1-10, 13, 14, 16 and 18-20 are pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 13, 14, 16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Yuasa et al. (US 2002/0048964).

Although it is noted that claims 13 and 18 are a product-by-process claim, product-by-process claims are directed to the product no matter how actually made. *In re Taylor*, 149 USPQ 615, 617 (CCPA 1966). Consequently, it is the patentability of the final product, and not the patentability of the process, that must be determined in a product-by-process claim. *In re Thorpe*, 227 USPQ 964, 966 (CAFC 1985), *Ex parte Edwards* 231 USPQ 981, 983 (BdPatApp&Int 1986).

In re claim 13, Yuasa et al. teach an epitaxial gallium nitride layer obtained by HVPE process (paragraph 0056)], wherein the *threading dislocation density ranges from 2×10^7 to 1×10^8 /cm²* (Fig.2).

In re claim 14, Yuasa et al. teach an *optoelectronic* component (i.e. a light-emitting diode, paragraph [0018]), provided with an *epitaxial* layer of *gallium nitride* 104, GaN (paragraph [0019]) according to claim 13.

In re claim 16, Yuasa et al. teach a gallium nitride 104 comprising an *epitaxial gallium nitride* layer (paragraph [0036]) obtained by epitaxial growth using HVPE (paragraph [0036]) on a crystalline substrate (i.e. the substrate has a surface along a (100) or (110) crystal orientation, paragraph [0064]).

In re claim 18, Yuasa et al. teach a *thick gallium nitride* layer obtained by HVPE process (paragraph 0056]) on a crystalline substrate, wherein the *thickness of the gallium nitride is 100 μm ~1,000 μm* (Fig.2).

4. Claim 16 is rejected under 35 U.S.C. 102(e) as being anticipated by Hayashi et al. (US 6,319,742).

Although it is noted that claim 16 is a product-by-process claim, product-by-process claims are directed to the product no matter how actually made. *In re Taylor*, 149 USPQ 615, 617 (CCPA 1966). Consequently, it is the patentability of the final product, and not the patentability of the process, that must be determined in a product-by-process claim. *In re Thorpe*, 227 USPQ 964, 966 (CAFC 1985), *Ex parte Edwards* 231 USPQ 981, 983 (BdPatApp&Int 1986). See M.P.E.P. 2113

Hayashi et al. teach a gallium nitride layer obtained by epitaxial lateral overgrowth on a crystalline substrate comprising an epitaxial gallium nitride layer (col. 10, lines 25-26).

5. Claims 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Vaudo et al. (US 6,440,823).

Although it is noted that claims 19 and 20 are a product-by-process claim, product-by-process claims are directed to the product no matter how actually made. *In re Taylor*, 149 USPQ 615, 617 (CCPA 1966). Consequently, it is the patentability of the final product, and not the patentability of the process, that must be determined in a product-by-process claim. *In re Thorpe*, 227 USPQ 964, 966 (CAFC 1985), *Ex parte Edwards* 231 USPQ 981, 983 (BdPatApp&Int 1986). See M.P.E.P. 2113

In re claim 19, Vaudo et al. teach a *freestanding gallium nitride* layer (col. 10, lines 53-55) obtained after separating from the starting substrate (col. 10, lines 65-67) of a *>100 μm-thick* GaN layer (col. 11, lines 34-36), wherein the gallium nitride is grown by HVPE and thus is an *epitaxial* layer (col. 16, line 9 and col. 18, lines 37-38) and has a *threading dislocation density less than $1 \times 10^8 \text{ cm}^{-2}$* (col. 7, lines 3-5).

In re claim 20, Vaudo et al. teach an *optoelectronic* component (e. g. Schottky rectifier, diodes, LEDs, col. 18, lines 62-67), providing with a *free standing gallium nitride* layer (col. 19, lines 21-22), wherein the gallium nitride layer has a *thickness of >100 μm* (col. 11, lines 34-36) and is an *epitaxial* layer (i.e. the gallium nitride is grown by hydride vapor phase epitaxy or HVPE, col. 7, lines 8-11) having a *threading dislocation density less than $1 \times 10^8 \text{ cm}^{-2}$* (col. 7, lines 3-5).

Allowable Subject Matter

6. Claims 1-10 are allowed.

Response to Arguments

7. Applicant's arguments filed 12/5/2005 have been fully considered but they are not persuasive for reasons as follows.

In re claims 13 and 18, applicant asserted that Yuasa fails to teach the process of allowable claims 1 and 9 for producing an epitaxial layer of GaN because Yuasa teaches a bulk GaN layer, not a uniformly distributed one. (third paragraph on page 7 of arguments)

In response to the argument, even though product-by-process claims are limited by and defined by the process, determination of patentability is **based on the product itself**. The patentability of a product does **not depend on its method of production**. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) When the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. See M.P.E.P. 2113

Furthermore, claims 13 and 18 do **not** recite a product (i.e. gallium nitride layer) having the characteristic of **uniformly distributed**, as asserted (third paragraph on page 7 of arguments). Even though applicant argued that the process of claims 1 and 9 would produce a gallium nitride layer having homogeneous-distributed threading dislocations (lines 5-6 of fourth paragraph on page 7 of the argument), the patentability of claims 13 and 18 is **based on the product itself** (i.e. an epitaxial gallium nitride layer having threading dislocation density ranges from 2×10^7 to 1×10^8 /cm² and a 100 μ m to 1 cm thick GaN layer). Thus, Yuasa reads on claims 13 and 18 because Yuasa expressly teaches the foregoing product, as stated in the 102(e) rejection.

Applicant further argued that Vaudo reference fails to teach all limitations of claims 19 and 20 (second paragraph, page 9 of the arguments), wherein applicant asserted that claims 19 and 20 depend from claim 18, which depends from claim 13, which originally depends from claim 1 or claim 9. Applicant maintained that since Vaudo is silent on the threading dislocation density and does not teach or suggest limitations of claim 1 or claim 9, thus Vaudo does not anticipate claims 19 and 20.

In response to the arguments, claims 19 and 20 are product-by-process claim, which considered a product claim. Therefore, the determination of patentability is **based on the product itself, not depending on its method of production**, as stated previously. Therefore, claim 20 only comprises limitations that are recited in claims 19, 18 and 13 only, excluding claim 1 or claim 9, wherein claims 1 and 9 are processing claims. Thus, claim 20 can be read as --an optoelectronic component, providing with a free standing gallium nitride layer, wherein the gallium nitride layer has a thickness of 100 μm to 1 cm and is an epitaxial layer having a threading dislocation density ranging from 2×10^7 to $1 \times 10^8 \text{ cm}^{-2}$ --.

In this regard, Vaudo expressly teach an optoelectronic component (e. g. Schottky rectifier, diodes, LEDs, col. 18, lines 62-67), providing with a free standing gallium nitride layer (col. 19, lines 21-22), wherein the gallium nitride layer has a thickness of 100 μm to 1 cm (col. 11, lines 34-36) and is an epitaxial layer (i.e. the gallium nitride is grown by hydride vapor phase epitaxy or HVPE, col. 7, lines 8-11) having a threading dislocation density less than $1 \times 10^8 \text{ cm}^{-2}$ (col. 7, lines 3-5). Therefore, Vaudo reference does read on claims 20 and 19.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Tuesday-Thursday (7:30 ~ 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2823

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jan 16, 2006

Hsien-ming Lee
Primary Examiner
Art Unit 2823

HSIEN-MING LEE
PRIMARY EXAMINER

1/16/06